



*United States Environmental Protection Agency
Office of Water
Office of Environmental Information
Washington, DC
EPA841-B-04-006*

Wadeable Streams Assessment Site Evaluation Guidelines



July 2004

FINAL

NOTICE

The intention of the WSA project is to provide a comprehensive “State of the Streams” assessment for streams across the United States. The complete documentation of overall WSA project management, design, methods, and standards is contained in five companion documents, including:

- *Wadeable Streams Assessment: Quality Assurance Project Plan*
- *Wadeable Streams Assessment: Site Evaluation Guidelines*
- *Wadeable Streams Assessment: Field Operations Manual*
- *Wadeable Streams Assessment: Benthic Laboratory Methods*
- *Wadeable Streams Assessment: Water Chemistry Laboratory Manual*

This document (Site Evaluation Guidelines) contains an overview of the process involved in locating a sampling site, evaluating the site, and selecting appropriate alternate sites when necessary, and is based on the guidelines developed and followed in the Western Environmental Monitoring and Assessment Program (Peck et al. 2003). Methods described in this document are to be used specifically in work relating to WSA. Mention of trade names or commercial products in this document does not constitute endorsement or recommendation for use. More detail of the project overview and of specific methods for sampling and sample processing can be found in the appropriate companion document.

The suggested citation for this document is:

USEPA. 2004. Wadeable Stream Assessment: Site Evaluation Guidelines.
EPA841-B-04-006. U.S. Environmental Protection Agency, Washington, DC.

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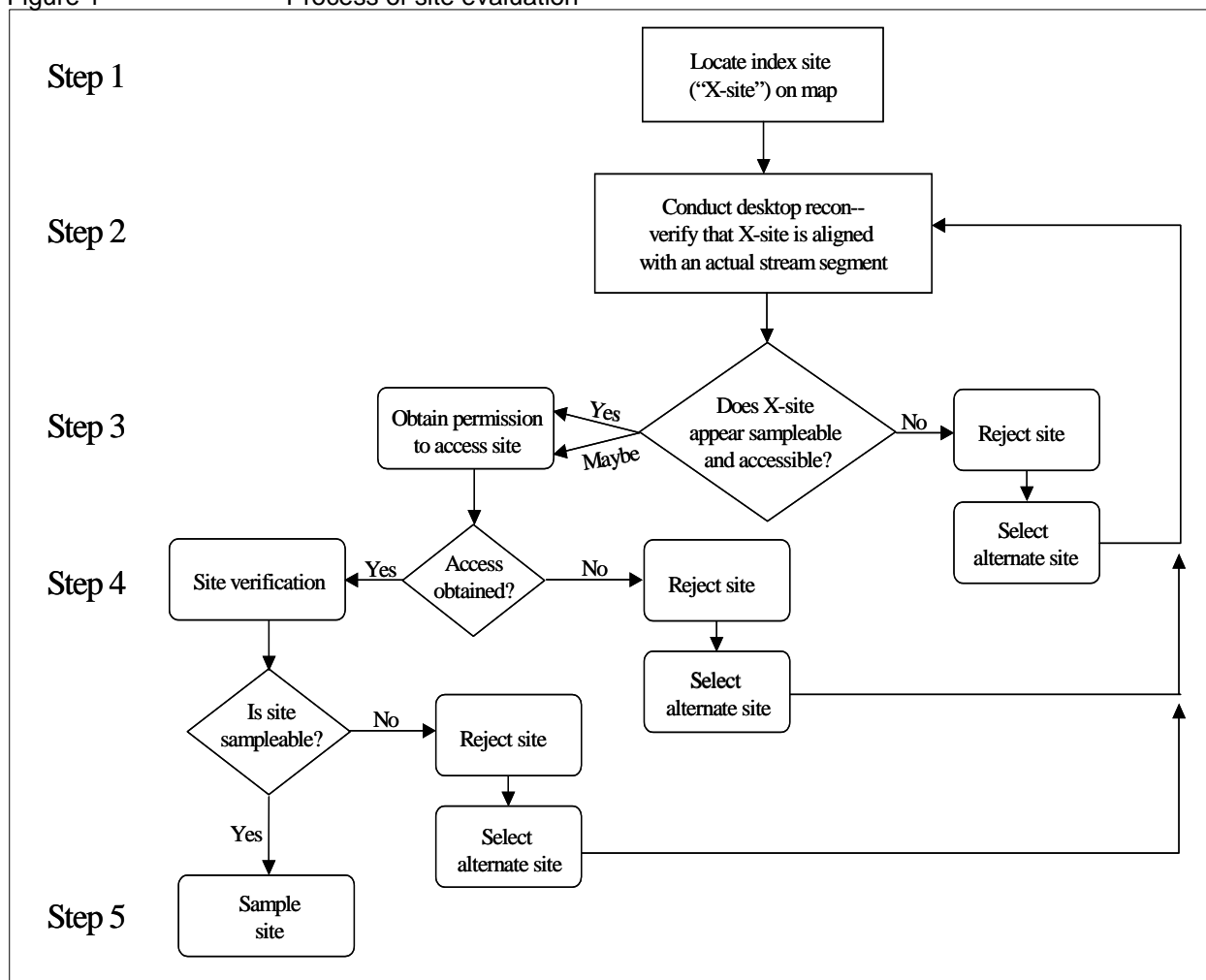
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WADEABLE STREAMS ASSESSMENT SITE EVALUATION GUIDELINES

This document is provided to clarify all of the steps involved in the process of locating and evaluating a sampling site for the Wadeable Streams Assessment. There are 5 steps involved in this process (Figure 1):

- Locate the index site ("x-site") on a topographic map and verify that the x-site is aligned with an actual stream segment
- Obtain permission to access the site
- Verify that the site is sampleable
- Sample the site *OR* replace with an alternate site

Figure 1 Process of site evaluation



Cooperators must assemble a dossier containing important locational and access information for each stream they are scheduled to visit. The dossier must contain the appropriate maps, contact information, copies of permission letters (if applicable), and access instructions. If the Cooperator is not a state agency, he/she must interact with the state to verify site locations. Before a stream visit, each field team should confirm access to the stream site if possible. The landowner(s) listed in the dossier should be contacted to confirm permission to sample and to identify any revisions to the information in the dossier.

1.0 LOCATING THE INDEX SITE ON A TOPOGRAPHIC MAP

Stream sampling points were chosen from the "blue line" stream network represented on 1:100,000 scale USGS maps, following a systematic randomized selection process developed for WSA stream sampling by the Office of Research and Development-Western Ecology Division. Each point is referred to as the "index site" or "X-site." The "X-site" is the mid-point of the sampling segment. The latitude/longitude of the X-site was listed on a regional sampling site spreadsheet that was distributed to the EPA Regional Monitoring Coordinators on a regional site information CD in February 2004. The Regional Monitoring Coordinators will make copies of the CD and distribute the CDs to each Cooperator within his/her region. The CD includes overlay maps of each X-site. The overlay maps include the state and county name where the X-site is located, along with the titles of the corresponding 1:100,000 and 1:24,000 scale USGS topographic maps. The sites are identified as primary ("panel" column) and alternate ("oversample" column). The primary sites are the ones of interest for this project. The alternate sites are only considered if the primary sites are rejected.

The Cooperator should print out each overlay map from the regional site information CD. The overlay maps are used in conjunction with 1:24,000-scale USGS topographic maps to locate and reference the sample point on the appropriate stream. The linework for US EPA's River Reach File Version 3-Alpha (RF3) is based on 1:100,000-scale Digital Line Graphs and, therefore, will not match exactly with the 1:24,000-scale maps. Use the RF3 linework to locate important features such as confluences or bends in the stream to assist in placing the X-site accordingly on the 1:24,000-scale (or 7.5") map. All RF3 lines are shown even though many are not stream traces. Line segments for lakes, inundated areas, wetlands and, occasionally, even map boundaries are shown as RF3 linework. Map names are provided for the USGS 1:24,000-scale and 1:100,000-scale topographic maps. EPA Region, USGS Cataloging Unit number, state, county and UTM zone are also included. All information, including the longitude/latitude, refers to the location of the sample point.

Line Descriptions for overlay map:

solid, thin lines	RF3 linework
solid, heavy line	Sampled segment (occasionally, other heavy lines will appear on the overlay map - please identify and use the site locator mark)

long-dashed lines	1:24,000 map boundaries
long-dash/short-dash line	State/County boundaries

The easiest way to transfer the X-site location from the overlay map onto the 7.5" topographic maps is to use a light table. Find the approximate position of the site from the latitude/longitude and then "line up" the overlay blue line features with the map features. Transfer a sample site "X" onto the topographic map from the overlay. It is important to note that the overlay features are taken from 1:100,000-scale maps and, therefore, lines are coarser in resolution than on the 7.5" map. If the overlay "X" does not fall exactly on the topographic map line (due to coarser resolution) place the "X" on the closest location on the stream. If there is no stream on the 7.5" map where the overlay shows a stream, please report this to the Regional Coordinator.

For ease of finding a site in a stack of maps, write the SITE_ID number by the potential sample location (or in the closest map margin) and again near the map name in the lower right corner of the map.

If you have any questions about the maps, how to use them or about how the sample was drawn, please contact Tony Olsen (541-754-4790, olsen.tony@epa.gov) or David Peck (541-754-4426, peck.david@epa.gov).

2.0 OBTAINING PERMISSION TO ACCESS CANDIDATE SITE

Each cooperator is responsible for obtaining permission for their sampling team to access their sampling sites. Obtaining permission prior to the sampling day is important to minimize loss of time on the part of the field team. Contact with the landowner can be done either through an "in-person" recon visit or through mailing out a cover letter signed by the Regional Monitoring Coordinator (Figure 2) with a permission slip (Attachment 1) for the landowner to return. In either case, a signed permission slip is important to use as documentation on the day of sampling. Some teams will choose to deal with access issues on the day of the sampling event. This method is usually adequate if a "desk-top reconnaissance" shows that the area around the site includes enough public land to gain access to the waterway. If the site is in an area that is largely privately owned land, waiting until the day of sampling could pose unnecessary delays and access issues that should have been resolved prior to the scheduled sampling day.

Landowner information can be obtained from the county tax assessor office. Tax assessor maps will display landowner boundaries, addresses and, oftentimes, phone numbers. This information enables the team to contact landowners before the sampling day, and identifies which landowner actually owns which portions of the stream bank. The provision of county maps for the field crews will clarify access to the targeted sampling reach.

(Date)

Dear Landowner:

The US Environmental Protection Agency, in cooperation with State Agencies, is conducting an environmental assessment of streams across the United States. A computer was used to randomly select these streams. A total of 500 stream sampling sites were selected for sampling in 2004. Water quality chemistry, aquatic life and habitat will be evaluated at each site. The findings of the study are not intended for enforcement or regulatory purposes.

We are contacting you prior to the site visit to obtain permission (form enclosed) to access the sampling site. We have enclosed a copy of a topographic map(s) with the site(s) identified by an "X" at the specific point on the stream to be sampled. We realize that working on your property is a privilege and we will respect your landowner rights at all times.

Please return the completed Access Permission Form in the enclosed envelope by (date). If you have any questions concerning this request, please contact me (phone number). We are looking forward to your reply.

Sincerely,

(Name)
Regional Monitoring Coordinator

Figure 2 Example of permission cover letter

3.0 SITE VERIFICATION

While traveling from a base location to a site, record a detailed description of the route taken on page 1 of the Verification Form (Attachment 2). This information will allow others to find the site again if it is selected for a repeat visit in the future. Upon reaching the X-site for a stream, confirm its location and that the team is at the correct stream. Record the information on page 1 of the Verification Form. Complete a Verification Form for each stream visited (regardless of whether it is sampled), following the procedures described below.

SITE VERIFICATION PROCEDURES

1. Find the stream location in the field corresponding to the X-site coordinates and the "X" marked on the 7.5" topographic map (X-site) prepared for each site. Record the routes taken and other directions on the Verification Form so that others can visit the same location in the future.

2. Use a GPS receiver to confirm the latitude and longitude of the X-site with the coordinates for the site. Make sure the GPS unit is set to reference the NAD 27 geospatial datum set. Record these on the Verification Form.
 3. Use all available means to ensure that you are at the correct stream as marked on the map including: 1:24,000 USGS map, topographic landmarks, county road maps, local contacts, etc.
 4. Scan the stream channel upstream and downstream from the X-site, determine whether the site is sampleable using the guidelines provided below, and mark the appropriate box on the Verification Form.
-

Sampleable Categories

- *Wadeable*--The stream can be sampled with wadeable stream protocols, continuous water flow and > 50% of the sample reach is wadeable.
- *Partial Sampled by Wading*--Over half the reach cannot be safely sampled by wadeable protocols.
- *Wadeable Interrupted*--The flow of water is not continual, but there is water in the sample reach (e.g. isolated pools).
- *Altered Channel*--There is a stream at the location marked with the X-site on the map, but the stream channel does not appear the way it is drawn on the map. An example of this is a channel rerouting following a flood event that cut off a loop of the stream. Establish a new X-site at the same relative position in the altered channel. (Make careful notes and sketches of the changes on the Verification Form.)

Non-Sampleable Categories (*permanent condition; stream becomes non-target*)

- *Dry Channel*--A discernible stream channel is present but there is no water anywhere within a 150-m reach centered on the X-site. If determined at the time of the sampling visit, record as "Dry-Visited"; if site was determined to be dry (or otherwise non-perennial) from another source and/or field verified before the actual sampling visit, record as "Dry-Not visited".
- *Non-wadeable*--The site can only be sampled by boat following non-wadeable river protocols.
- *Wetland*--(No definable stream channel) There is standing water present, but no definable stream channel. In cases of wetlands surrounding a stream channel, define the site as sampleable but restrict sampling to the stream channel.
- *Map Error*--No evidence that a water body or stream channel was ever present at the coordinates provided for the X-site.

- *Impounded stream*--The stream is submerged under a lake or pond due to man-made or natural (e.g., beaver dam) impoundments. If the impounded stream, however, is still wadeable, record the stream as "Altered" and sample.
- *Other*--The site is non-target for reasons other than those above. Examples include underground pipelines or a non-target canal (*refer to the following guidelines*).

A sampling site must meet both of the following criteria to be classified as a non-target canal:

- i. The channel is constructed where no natural channel has ever existed.
- ii. The sole purpose/usage of the reach is to transfer water. There are no other uses of the waterbody by humans (e.g., fishing, swimming, boating).

Non-Sampleable Categories (*temporary condition; stream can be revisited*)

- *Other*--The site could not be sampled on that particular day, but is still a target site. Examples might include a recent precipitation event that has caused unrepresentative conditions.

No Access to Site Categories

- *Access Permission Denied*--You are denied access to the site by the landowners.
- *Permanently Inaccessible*--Site is unlikely to be sampled by anyone due to physical barriers that prevent access to the site (e.g., cliffs).
- *Temporarily Inaccessible*--Site cannot be reached at the present time due to barriers that may not be present at some future date (e.g. forest fire, high water, road temporarily closed, unsafe weather conditions)

5. Do not sample non-target or "Non-sampleable" or "No Access" sites. Place an "X" in the "NO" box for "Did you sample this site?" and check the appropriate box in the "Non-Sampleable" or "No Access" section of the Verification Form; provide detailed explanation in comments section.

The primary distinction between "Sampleable" and "Non-Sampleable" streams is based on the presence of a defined stream channel and water content. If the site is non-sampleable or inaccessible, the site visit is completed, and no further sampling activities are conducted.

4.0 SELECTING ALTERNATE SITES

The sampling site lists for the Wadeable Streams Assessment are organized into EPA Regional spreadsheets. Each spreadsheet contains a list of all primary (panel=1) and alternate (oversample=1) sites in the Region. The sites are listed on the spreadsheet in the order in which they were randomly selected. All primary (panel=1)

sites should be sampled unless they are determined to be non-sampleable or not accessible. If a primary site is rejected because it is non-sampleable or not accessible, then it will be replaced by an alternate site within the same EPA Region. The alternate site may or may not be within the same state or ecoregion as the primary site it is meant to replace.

When a primary site is rejected, the sampling/reconnaissance team must contact the EPA Regional Coordinator to report it. The Regional Coordinator will then pick the next site from the alternate list to replace it. The Regional Coordinator will be responsible for contacting the appropriate state, Cooperator, or field team to inform them of the addition of the new site. The Regional Coordinator must also contact the Project Facilitator, so a record of all sites considered to be target or non-target can be documented.

When a primary site is rejected for sampling, the Regional Coordinator will select the first alternate site listed from within that region. The first alternate site is the first site on the regional spreadsheet that has a value of "1" in the "Oversample" column (see Fig. 3). For example, if site number 0463 is reported as non-sampleable, the first alternate site, number 0522, will be added as a replacement. (Note that the rejected site is located in Virginia, and the alternate site is in Pennsylvania.) When another site is rejected, the next alternate site, site number 0527, will be added. As primary sites are rejected, the Regional Coordinator will continue to replace them with alternate sites by selecting the next alternate site on the list, regardless of the state.

Site_id	Primary Name	Long-DD	Lat-DD	Site	Site	Strat	Panel	Oversamp	MD	Nest1	RF3RC	Strahler	State	EPA
OWW04440-0442	Ross Run	-79.129	40.833			1	1	0	31	1882	050100	2	PA	3
OWW04440-0454		-77.669	38.888			1	1	0	37	1661	020700	1	VA	3
OWW04440-0463		-77.232	37.383			1	1	0	44	1227	020802	3	VA	3
OWW04440-0474	Shippen Run	-79.098	41.27			1	1	0	8	3542	050100	1	PA	3
OWW04440-0484	BLUESTONE R	-81.318	37.327			1	1	0	18	2678	050500	3	WV	3
OWW04440-0486	White Sulphur Run	-78.499	39.643			1	1	0	6	3626	020700	1	MD	3
OWW04440-0495	LITTLE CALFPAS	-79.428	38.012			1	1	0	31	1882	020802	2	VA	3
OWW04440-0498	West Branch Perk	-75.531	40.377			1	1	0	47	862.4	020402	2	PA	3
OWW04440-0503	PISCATAWAY CR	-76.835	37.893			1	1	0	44	1227	020802	3	VA	3
OWW04440-0522	Seidel Creek	-75.881	40.259			1	0	1	37	1661	020402	1	PA	3
OWW04440-0527		-75.659	37.531			1	0	1	15	2916	020802	1	VA	3
OWW04440-0532	Wrights Valley Cr	-81.399	37.22			1	0	1	6	3626	050500	1	VA	3
OWW04440-0543		-79.036	37.734			1	0	1	37	1661	020802	1	VA	3
OWW04440-0550	Goose Cr-N Fk	-77.673	39.059			1	0	1	44	1227	020700	4	VA	3
OWW04440-0559	GRAYS CR	-76.869	37.165			1	0	1	47	862.4	020802	2	VA	3
OWW04440-0564		-79.104	36.597			1	0	1	47	862.4	030101	2	VA	3

Figure 3

Excerpt from Region 3 site spreadsheet

The Regional Coordinator will report the change to the appropriate state and field team, and to the Project Facilitation Team:

Point of contact:	Jennifer Pitt 443-465-7663 (for mobile phone users) 800-504-4861 (for landline calls)
Alternate contacts:	Kristen Pavlik Michael Barbour, Project Facilitator 410-356-8993 (Tetra Tech, Inc. office)

5.0 LITERATURE CITED

Peck, D.V., J.M. Lazorchak, and D.J. Klemm (editors). Unpublished draft.
Environmental Monitoring and Assessment Program -Surface Waters: Western
Pilot Study Field Operations Manual for Wadeable Streams.
EPA/XXX/X-XX/XXXX. U.S. Environmental Protection Agency, Washington,
D.C.

Attachment 1
Example of Landowner Permission Slip

I grant permission to the biological field crew from (state agency, Cooperator, or contractor) to access the stream sampling site located on my property as part of the EPA's Wadeable Streams Assessment project.

_____ Do grant permission

_____ Do grant permission but with the following restrictions:

_____ Do not grant permission

Landowner Name (Please print): _____

Landowner Signature: _____

Date: _____

Phone Number: _____

Address: _____

*If the operator is different than the landowner, please list the name and phone number below so that we may contact the operator before the site visit.

